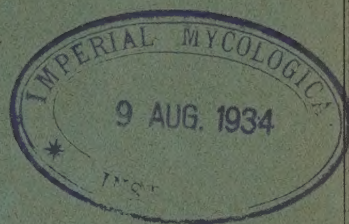


THE
ADVISORY DEPARTMENT
IMPERIAL COLLEGE OF TROPICAL AGRICULTURE.



REPORT

ON THE

Agricultural Department

ANTIGUA

1933.

ISSUED BY THE COMMISSIONER OF AGRICULTURE

FOR THE WEST INDIES.

1934.

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Report on the Agricultural Department, Antigua, for the year 1933.

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LETTER OF TRANSMITTAL.

GAJ:SG.

C. A. 233/34.

10th February, 1934.

Sir,

I have the honour to transmit herewith the Annual Report by the Agricultural Superintendent on the working of the Agricultural Department of Antigua for the year ending December 31st, 1933.

2. Another record crop of sugar was made during the year the production reaching 23,875 tons and exports 22,373 tons of sugar. The value, however, was disappointingly low at £194,703 or £8.7 per ton. The large crop was the result of favourable weather conditions during 1932. The crop for 1934 is estimated at 20,000 tons.

3. During the year the leading sugar planters took active steps towards organizing a sugar cane investigation committee. This committee working in co-operation with the agricultural department and with the Imperial College of Tropical Agriculture, Trinidad, will in future assume responsibility for the investigational work in connection with sugar cane. The services of Mr. P. E. Turner, a member of the College staff, have been made available as Adviser in sugar cane experiments, a subject in which Mr. Turner has special knowledge and experience.

4. To enable the work of the Department to be extended to include more detailed experimental work on sugar cane the staff has been increased by the filling of the vacancy caused by the retirement of Mr. Gallwey, the Agricultural Assistant, three years ago.

5. Valuable contributions to the sugar cane industry of the Island have been made during the year by Professor Hardy of the Imperial College of Tropical Agriculture who published his work on the Sugar Cane Soils of Antigua and by Mr. H. E. Box who has continued the work of distributing the Cuban parasite (*Lixophaga*) of the moth borer. Efforts are being made to secure the continuation of the services of Mr. Box to the industry for another term of years. A visit by Dr. McIntosh, Plant Geneticist, Central Cane Breeding Station, Barbados, was in connection with the study of sugar cane varieties.

6. The Sea Island Cotton Industry which is of particular value to the peasantry and to certain estates especially in dry years, continues to be conducted on a very much reduced scale. Nevertheless the Department is paying attention to the question of quality and a supply of seed of a pure line is maintained in the Island in co-operation with the Agricultural Department in Montserrat. A Conference of Cotton Growers was held in Trinidad during the year and steps were taken to form the West Indian Sea Island Cotton Association to further the interests of the industry. The Antiguan Cotton Growers' Association which was established many years ago sent a representative to the Trinidad Conference.

7. Satisfactory progress is recorded in this report of the work of Land Settlement, a subject in which His Excellency the Governor has shown particular interest. The purchase of another estate during the year brings the total of these schemes to three. The officers of the department continue to devote a great deal of attention to the welfare of the settlers. It will be recalled that for the first ten years the allottees must conform to a standard of agriculture laid down by the agricultural officers.

8. By undertaking to give a course of lectures to overseers and a separate course to Primary School teachers the cause of agricultural education continues to receive attention.

9. I have pleasure in recording my appreciation of the efficient way in which the work of the Agricultural Department is carried on in Antigua. With the augmented staff now approved continued progress may be confidently anticipated.

I have the honour to be,

Sir,

Your obedient Servant,

(Sgd.) G. A. JONES,

Commissioner of Agriculture.

The Honourable,

The Colonial Secretary,

ANTIGUA.

Report on the Agricultural Department, Antigua

For the Period January to December, 1933.

STAFF OF THE AGRICULTURAL DEPARTMENT, 1933.

Agricultural Superintendent	..	F. H. S. Warneford, M.A., B.Sc., A.I.C., F.C.S.
Agricultural Superintendent		
(Acting) May 27—October 25	..	V. G. Periera.
Agricultural Assistant	..	(Vacant).
Junior Assistant	..	V. G. Periera.
Assistant Clerk (Office)	Jan. 1—	
Nov. 4	..	M. A. R. Potter.
Assistant Clerk (Office)	Nov. 5—	
Dec. 31	..	G. L. Bellot.
Assistant Clerk (Field)	..	S. H. Abbott.
Cotton Inspector	..	R. L. V. Hall.

The Agricultural Superintendent was on vacation leave from May 27 to October 25 and on sick leave from November 11 to November 18 and from December 8 to December 18. Mr. Abbot was on sick leave from January 7 to January 14 and from March 27 to April 12.

Mr. Hall continued to act as whole time Cotton Inspector and the services of Mr. C. H. E. Shepherd, M.C., of the Public Works Department were also available for cotton inspection during the actual period in which cotton fields were being destroyed prior to the Close Season.

Mr. W. A. Gore was employed from October 21 to December 31 in the compilation of statistics in connection with sugar cane field returns and in laying out certain sugar cane experiments.

DETAILS OF ADMINISTRATION.

EXPENDITURE.

Head 7.	Salaries	..	..	..	£1,096	18	11	
	House Allowances	..	..	..	40	0	0	
	Transport Allowances	..	..	..	164	19	2	
	Greencastle and Other Experimental Work	..	..	..	424	14	11	
	Planting and Maintaining Trees	..	..	..	29	17	11	
	Fumigation of Plants	..	..	..	3	2	7	
	Printing Reports and Contingencies	..	..	..	24	4	9	
	Destruction of Wild Cotton and Okra Plants	..	..	..	5	17	8	
	Distribution of Cotton Seed	..	..	..	nil			
	Distribution of Paris Green	..	..	..	nil			£1,789 15 11
Head 28.	Land Settlement.							
		Greencastle.		Matthews.			Jonas's.	
	Plant and Material		9	16	0	2	1	6 ¹
	Supervision	.. 12 0 0	12	0	0			
	Labour	.. 16 0 6	6	9	0	8	1	6 ²
	Sundry Other Charges	..	2	11	8	1	0	0
		28 10 6	30	16	8	11	3	0
								70 10 2
Advances for Land Settlement Purposes.								
	Purchase of Fertilizers	..	44	3	4 ³			
	Land Settlement Cultivation	..	30	12	10 ⁴			
	Care of Canes Jonas's	..	5	17	6 ⁵	80	13	8
Deposits in connection with Land Settlement.								
	Sale of Crops.							
	Sale of Canes, Greencastle	..	849	1	9			
	Sales of Canes, Matthews,	..	341	6	4	1,190	8	1
	Carried forward					£3,131	7	10

1 and 2 spent through C.D.F. Engineer.

3 Loan recoverable 1934.

4 Loan part recovered 1933, part recoverable 1934, part 1935.

5 Recoverable on reaping 1934 crop.

	Brought forward				£3,131	7	10
Advances other than Land Settlement.							
Purchase of Vegetable Seed ..		7	10	7			
Purchase of Text Books for Agricultural Reading Course ..		4	16	3	12	6	10
Deposits other than Land Settlement.							
Purchase of Onion Seed ..					19	16	9
Total ..					£3,163	11	5

RECEIPTS.

Revenue. Head 4, Agricultural Receipts.							
Sale of Plants ..	16	15	7				
Sale of Seeds ..	5	1	8				
Sale of Produce ..		19	6 ⁶				
Sale of Formalin ..	22	19	0	45	15	9	
Head 8, Sale of Pamphlets				6	45	16	3
Advances. Advance for Land Settlement Cultivation ..		17	18	9			
Purchase of Vegetable Seed ..		13	15	3			
Co-operative Marketing ..			3	1			
Purchase of Text Books ..		5	9	9	37	6	10
Deposit. Sale of Crops.							
Sale of Produce, Experiment Station ..		141	12	7*			
Sale of Canes, Greencastle ..		855	17	3			
Sale of Canes, Matthews ..		348	6	10			
Purchase of Onion Seed ..		19	13	4	1,365	10	0
Total ..					£1,448	13	1

The true revenue of the Agricultural Department for the year was as follows:—

Sale of Plants and Produce ..	159	3	5				
Sale of Seeds** ..	5	1	8	164	5	1	
Total ..				£164	5	1	

PLANT IMPORTATIONS.

During the year the following plants and seeds were imported:—

PLANTS OR CUTTINGS.

Bread Nut.—Seventeen plants from Montserrat.

Sweet Potato (Brooks Seedling No. 3).—Fifty pounds from Barbados.

SEEDS.

Cotton Seed.—Fifty pounds from Montserrat.

Pigeon Pea varieties.—From Montserrat.

Dhulia Onion Seed.—From India through the Commissioner of Agriculture.

Teneriffe Onion Seed.—Forty-five pounds from Teneriffe.

Vegetable Seed.—18 lb. 1 oz. from W. Atlee Burpee & Co., U.S.A.

⁶ Sale of produce not from G.C. Expt. Station.

* £141 8. 1. revenue from Experiment Station paid into Deposit to be repaid to Land Settlement as Land Settlement Funds were used in establishment of the Station, in addition to 4/6 spent from deposit on weighing canes.

** Excess of sales after clearing advance.

Brooks Seedling No. 3 is reported to be the most promising of a series of Queensland sweet potato varieties imported into Barbados in 1929. It is a white potato and is stated to have yielded consistently well.

The pigeon pea varieties imported from Montserrat originated at the Imperial College of Tropical Agriculture with the exception of one variety "Red Dahl," which was obtained from India. These seeds have been used for the establishment of varietal plots at the experiment station: a report on these will appear in the 1934 Report.

The Dhulia Onion seed gave disappointing results at the Experiment Station: the yield was poor and the onions failed to set seeds as was hoped might be possible.

PLANT AND SEED DISTRIBUTION.

The following plants and seeds were distributed during the period under review:—

			In Antigua.	Abroad.
Cane Cuttings ..	..	..	14,890	236 (200 Tortola, 36 St. Lucia)
Guatemala Grass Cuttings	..	..		50 (Tortola).
Sweet Potato Cuttings	..	..	500	
Nelumbium Cuttings	..	..		1 (St. Vincent).
Onion Seedlings	..	..	16,000	
Tomato Seedlings	..	..	13,785	
Pineapple Slips	..	..		25 (Tortola).
Guava	..	..	91	
Budded Limes	..	..	170	
Grafted Mangoes	..	..	12	
Seedling Mangoes	..	..	2	
Budded Pears	..	..	55	
Budded Oranges	..	..	382	
Tangerines	..	..	36	
Grape Fruit	..	..	67	
Bread Fruit	..	..	14	
Bread Nut	..	..	5	
Casuarina	..	..	308	
Eucalyptus	..	..	29	
Whitewood	..	..	15	
Flamboyante	..	..	129	
Gliricidia	..	..	112	
Bay	..	..	50	
Lilac	..	..	44	
Miscellaneous (decorative)	..	..	240	
Miscellaneous (economic)	..	..	6	
Miscellaneous (Fruit trees)	..	..	54	
Onion Seed	..	..	41 lb. 10 oz.	
Vegetable Seed	..	..	3 lb. 11 oz. and 864 pkts.	
Talipot palm Seeds	..	..		12 pkts. (W. I. Depts. of Agriculture)
Prosopis Juliflora seeds	..	..		1 pkt. (Dominica)
Alysicarpus rugosus seeds	..	..		1 pkt. (Barbados)
Calotropis Procera seeds	..	..		1 pkt. (Canada).

WORK AT GREENCASTLE EXPERIMENT STATION.

NURSERY WORK.

(A) *Sugar Cane*.—The following varieties were cultivated as plant canes:— B.3922, B.4596, B.11569, B.417, B.374, B.381, B.726, B.891, B.2935, S.C.12/4, G.119, G.140, G.150, P.O.J.36, P.O.J.213, P.O.J.2714, P.O.J.2725, P.O.J.2727, P.O.J.2878, Co.281, M.3, M.7, M.42, F.C.916 and F.C.988. B.4507, Co.213, and Co.221 were grown as first ratoons. Co.281 and B.2935 were mentioned as new introductions in the report for 1932. The former variety appears to be a vigorous grower and prolific stooler. B.2935

which is one of the most promising of the newer Barbados seedlings has been rapidly extended by the modified Java process and there are now about 1,400 stools of this variety in the Experiment Station from which it is hoped to obtain sufficient planting material for its inclusion in the 1933—35 varietal experiments at four stations.

The M canes again made only fair growth. They appear to be especially susceptible to borer damage.

The F.C. varieties were obtained through the courtesy of a planter who had obtained them direct from Porto Rico. F.C.916 appears to be a very promising variety under the conditions existing at the Experiment Station, and is being rapidly extended.

G. 140 again made very poor growth: it is one of a list of varieties which will be discarded in accordance with the advice of Dr. McIntosh of the Central Cane Breeding Station.

(B) *Fruit and Vegetables.*

Citrus Fruit.—The following citrus fruit plants were produced during the period under review:—

Washington Naval Orange ..	..	..	287
Valencia Orange ..	..	..	55
Archbishop Orange ..	..	..	117
Marsh's Seedless Grape Fruit ..	..	..	133
Tangerine ..	..	..	53
Total Citrus ..			645

A new citrus nursery of approximately four hundred Sour Orange stocks and 150 rough lemon stocks was established during the year for working during 1934.

Mangoes.—It has been found that budded and grafted mangoes worked in pots have not made satisfactory aftergrowth under Antigua conditions, but that plants budded 'in situ' or when growing in large receptacles have made rapid aftergrowth. Trials have therefore been made with stocks growing in nursery beds where ample root growth is possible and have given promising results: forty stocks were patch budded and thirty side grafted, giving thirty-four and twenty-one successes respectively.

In view of these results a nursery of three hundred and fifty stocks has been established for working in the spring of 1934.

Top Working of Mangoes.—Reference has been made in earlier reports to the poor results obtained with top working. Trees top worked with the variety Julie have been under observation during the past two years and although the attacks of fungus on the new shoots have been less severe the trees have grown only slowly.

Trials with a type of Ceylon appear to be giving better results but it is still too early to form definite conclusions.

Avocado Pears.—One hundred stocks were raised during the latter part of the year and will be grafted as soon as scions of a suitable variety are received from St. Lucia.

Pineapples.—A nursery of two hundred plants was established during the year.

Onions and Tomatoes.—Several thousand onion and tomato seedlings were grown during the year: most of the latter were supplied free of cost to allottees of the Greencastle Land Settlement.

FRUIT PLOTS.

Citrus.—The plots established in 1931 and in 1932 made fair progress. Attacks of scale insect have been almost completely controlled by spraying with

Sulphemulsol, a new combined insecticide and fungicide which is a product of the Trinidad Oilfields (Trinidad Leaseholds Ltd.).

During 1933 these plots were extended with the following plants, twelve Valencia Orange, one Archbishop Orange, three Mandarins, five Tangerines and six Marsh's Seedless Grape Fruit.

A further small plot of seven Marsh's Seedless Grape Fruit was established in a hollow near the stream.

Mangoes.—Most of the plants growing in the Border between the stream and the model allotment have made good growth: a few dwarfed specimens are to be replaced. A plot of fourteen stocks for budding and eight grafted plants of good varieties was established west of the main cane nursery.

Pineapples.—A plot of three hundred and seventy-four plants has been established in the fruit border.

EXPERIMENTAL WORK.

(A) *Sugar Cane*.—For convenience the results of experiments conducted at the Experiment Station with sugar cane are included in the section on general sugar cane experiments.

(B) *Sweet potatoes*.—The varietal trial planted in July, 1932, with the varieties New Jersey, Bert, Red Nut, Moore, White Gilkes, and Black Charlotte, was reaped during the period under review.

It was found on reaping that differences in soil fertility had adversely affected the plots of Bert, Black Charlotte and New Jersey, and accordingly the results from these plots, which may be misleading, are not recorded here. The average yields of the other three varieties were:—

Moore	..	..	10,075 lb. per acre.
Red Nut	..	..	9,610 " " "
White Gilkes	..	..	8,370 " " "

A varietal experiment with the following varieties, Bert, Red Nut, Moore, White Gilkes, New Jersey, and V. 52 has been laid down in another portion of the Station for reaping in 1934. The lay out consists of four randomised blocks.

(C) *Eddoes*.—The varietal trial planted in May, 1932, in six randomised blocks with the varieties Tannia Eddoe, Tannia Roliza, Tannia Priete, Tannia White, Tannia Yellow and Tannia Roliza White, was reaped during the period under review.

The yields per acre were:—

Tannia Eddoe	..	10,550 lb.
Tannia White	..	9,500 "
Tannia Priete	..	8,600 "
Tannia Roliza	..	8,280 "
Tannia Roliza White	..	8,000 "
Tannia Yellow	..	7,280 "

The experiment does not satisfy the Z test so that these results are not significant.

(D) *Yams*.—The yam varietal experiment plots planted in May, 1932, made excellent growth but were so severely injured in the storm which passed North west of Antigua on the night of September 25th, 1932, that the results are not reliable and are not recorded.

(E) *Tomatoes*.—An experiment with seven English tomato varieties was conducted during the early months of 1933 with the object of making a trial shipment to the United Kingdom and at the same time of obtaining some qualitative information as to their suitability for cultivation in Antigua. Single plots only were planted of the individual varieties. All plants were set at two feet intervals on banks four and one half feet wide, staked and pruned to single

stems. The total area under the experiment was manured with a complete fertilizer—40 lb. Potassium Sulphate, 40 lb. Sulphate of Ammonia and 80 lb. Superphosphate.

The following table shows the calculated yields per acre and the classification of the fruit reaped. By the expression "Marketable" is meant all fruit of good shape over two inches in diameter and entirely free from blemishes.

Variety	Yield lb. per acre.	A		B	Market- able Fruit % of total yield.	Cracks % B.	Fungus % B.	Insect Damage % B.
		Discards Badly shaped or too small. % of total yield.		Well shaped and of market- able size. % of total yield.				
		Size	Shape					
Comet ...	14,800	41	4	55	34	1.8	22*	15
Everyday ...	16,300	44	6	50	39	3.6	3.6	13
Satisfaction ...	14,600	48	9	43	30	5.4	3.6	15
Ailsa Craig ...	12,400	62	5	33	24	1.8	3.6	11
Kondine Red...	10,600	60	4	36	25	1.8	5.4	13
Sunrise ...	11,400	85	-	15	5	-	7.2	11
Princess of Wales ...	10,900	61	4	35	25	1.8	7.2	9

A trial shipment was made per s.s. *Ingoma* on March 4th, the tomato crates being carried on deck and the fruit shipped when full but quite green. The report stated that considering the fact that the fruit were carried on deck the general condition was satisfactory. The varieties most favoured by buyers were Comet and Satisfaction which were stated to compare favourably with the Tenerriffe tomatoes then on the market. One crate of the large sized Comet realised 5/- and it is suggested that the average price for fruit of this type would be from 4/- to 5/- per crate, at which price it is estimated that the net proceeds would amount to from 1d. to 1½d. per lb.

This compares favourably with the prices recently obtained in the Canadian Market, but without cool storage at reasonable rates and regular shipping opportunities there is no chance of developing the trade.

(F) Sorrel. During the visit to the West Indies of the Canadian Trade Exhibition Ship early in 1932 it was suggested that dried sorrel might find a ready market in Canada. With a view to obtain sufficient dried sorrel for a trial shipment and also information as to yields and cost of production when grown on the field scale, four 1/20 acre plots were established at the experiment station in May 1933 the planting material used being seedlings from nursery beds planted in the previous month. The plots were reaped in December.

The following table shows the Spacing, Manurial treatment and Yields of the four plots. No significance is claimed for these results from single plots but the results appear of sufficient interest for recording.

* Chiefly Blossom End Rot.

SORREL EXPERIMENT.

Plot No.	Spacing.	Manurial Treatment.	Yield.	
			Weight as reaped.	Estimated wet wt. per acre.
1.	4½' x 6'	Nil	154 lb.	3080 lb.
2.	4½' x 4'	Pen Manure 30 ton per acre.	251 "	5020 "
3.	4½' x 6'		243 "	4860 "
4.	4½' x 4'		290 "	5800 "
	Total Yield.		938 "	
	Average yield per acre.		4650 "	

The sun dried product weighed 54 lb.

The following is a summary of the expenditure:—

Preliminary Cultivation	..	..	..	£1. 0. 7
Manure & Manuring (Plots 3 & 4)	..	..	..	17. 6
Plants & Planting	..	..	..	3 0
Weeding	..	..	..	4. 0
Reaping & Drying	..	..	..	£1. 4. 0
				£3. 9. 1

Cost of production per lb. dry sorrel (all plots.)	..	1/3
Cost of production per lb. dry sorrel (no manure plots)		1/1½

MODEL ALLOTMENT.

In the report for 1932 it was stated that in future the report on the Model Allotment would refer to the crop year rather than to the calendar year so that the annual returns of revenue and expenditure would more clearly indicate which crops have proved profitable and which have resulted in losses. The present report covers the period January—September, 1933, and future reports will refer to the year October 1st—September 30th. While this period is preferable to the calendar year, it is impossible to select any period which covers one complete crop on all the plots. For this reason in addition to the usual statement of the annual revenue and expenditure for the various units (Table A) the revenue and expenditure on the individual crops are also shown. (Table B.)

The main conclusions reached in 1932 have been confirmed in 1933. Sugar cane with catch crops (especially tomatoes) has proved remunerative. Profits have been made with sweet potatoes, eddoes and cassava, but this year there has been a small loss on the yam plot.

Pigeon peas have again proved unprofitable but in view of the expected benefits of a deep rooting crop on the heavy soil of the allotment, peas will continue in the rotation for the present.

Carrots, beets and turnips have proved profitable vegetable crops. Losses have been incurred with cabbages, onions, beet and beans. The last mentioned crop suffered from the very wet weather at the end of 1932.

Tomatoes have proved a most profitable crop whether grown as a main vegetable crop or as a catch crop on cane plots. Should the Canadian market for West Indian tomatoes ever again offer reasonable prices, tomato growing can confidently be recommended to those allottees who are prepared to devote the necessary care to the control of insect pests.

Considerable improvement was observed in the fruit plot as the result of the destruction of the Elephant and Guatemala grass wind breaks, the roots of which were injuring the young trees.

The expenditure during the period under review amounted to £39 7. 6. and the revenue to £61 10., there being a profit of £22 2. 6.

The total expenditure since the laying down of the plots amounted to £124 19. 0. and the total revenue to £108 7. 9. The adverse balance has thus been reduced from £38 13. 9. at the end of 1932 to £16 11. 3. at the end of September, 1933. This adverse balance largely due to the expenditure of £11 12. 0. on the fruit plot from which no revenue has yet been recovered.

MODEL ALLOTMENT.
TABLE OF PLOT EXPENDITURE AND REVENUE.

TABLE A.

PLOTS 1 & 2.			PLOT 3.			PLOTS 4 & 5.			PLOT 6.		
First Ratoons	1931	First Ratoons	1931	First Ratoons	1931	First Ratoons	1931	First Ratoons	1931	First Ratoons	1931
Stock Plot	1932	Vegetables	1932	Vegetables	1932	Vegetables	1932	Pigeon Peas	1932	Pigeon Peas	1932
Sweet Potatoes	1933	Peas and Beans	1933	Stock Plot	1933	Stock Plot	1933	"	1933	"	1933
The following varieties were planted in July 1933: V. 52. White Gilkes, Moore, Red Nut and Bert.											
EXPENDITURE.			EXPENDITURE.			EXPENDITURE.			EXPENDITURE.		
1933	£ s. d.	1933	£ s. d.	1933	£ s. d.	1933	£ s. d.	1933	£ s. d.	1933	£ s. d.
Weeding	0 9 0	Cultivation of	0 18 9	Cultivation of	3 14 4	Cultivation of	3 14 4	Reaping &c.	0 2 9	Reaping &c.	0 2 9
Forking	0 10 6	Vegetables	0 18 9	Mixed Vegetables	1 0 6	Mixed Vegetables	1 0 6				
Lining	0 1 4	Cultivation of	0 18 1	Tomatoes	2 13 4	Tomatoes	2 13 4				
Banking	0 8 4	Peas & Beans	0 18 1	Stock Posts	0 0 6	Stock Posts	0 0 6				
Trenching	0 12 8		1 16 10								
Manuring	0 4 8										
Planting	0 5 8										
Insect control	0 1 6										
Previous Expenditure	2 13 8	Previous Expenditure	4 4 0	Previous Expenditure	7 15 2	Previous Expenditure	7 15 2	Previous Expenditure	1 19 5	Previous Expenditure	1 19 5
Total	3 16 4	Total	6 0 10	Total	11 9 6	Total	11 9 6	Total	2 2 2	Total	2 2 2
REVENUE.			REVENUE.			REVENUE.			REVENUE.		
1933	£ s. d.	1933	£ s. d.	1933	£ s. d.	1933	£ s. d.	1933	£ s. d.	1933	£ s. d.
Onions	0 3 9	Onions	0 3 9	Onions	0 3 9	Onions	0 3 9	Peas	0 3 10	Peas	0 3 10
Carrots	0 13 0	Carrots	0 13 0	Carrots	0 13 0	Carrots	0 13 0				
Beet	0 6 4	Beet	0 6 4	Beet	0 6 4	Beet	0 6 4				
Turnips	0 6 3	Turnips	0 6 3	Turnips	0 6 3	Turnips	0 6 3				
Tomatoes	2 4 0	Tomatoes	2 4 0	Tomatoes	10 4 0	Tomatoes	10 4 0				
	3 13 4		3 13 4		11 13 10		11 13 10				
Previous Revenue	1 10 0	Previous Revenue	1 13 10	Previous Revenue	2 18 2	Previous Revenue	2 18 2	Previous Revenue	1 2 6	Previous Revenue	1 2 6
Total	1 10 0	Total	5 7 2	Total	14 12 0	Total	14 12 0	Total	1 6 4	Total	1 6 4
Deficit 1933	2 13 8	Deficit 1933	—	Deficit 1933	—	Deficit 1933	—	Deficit 1933	—	Deficit 1933	—
Total Deficit	2 6 4	Total Deficit	0 13 8	Total Deficit	0 13 8	Total Deficit	0 13 8	Total Deficit	0 15 10	Total Deficit	0 15 10
Profit 1933	—	Profit 1933	1 16 6	Profit 1933	7 19 6	Profit 1933	7 19 6	Profit 1933	0 1 1	Profit 1933	0 1 1
Total Profit	—	Total Profit	—	Total Profit	3 2 6	Total Profit	3 2 6	Total Profit	—	Total Profit	—

MODEL ALLOTMENT.

TABLE A.

PLOTS 7—12.			PLOTS 13—17.			PLOTS 18—22.		
EXPENDITURE. 1933 Reaping and Transport 3 14 8 Weeding 0 16 3 Cultivation 0 11 6 Ranging Trash 0 5 7 Manure and Manuring 1 4 9 Previous Expenditure 6 12 9 Total Expenditure 15 12 11			EXPENDITURE. 1933 Insect control Tomatoes 1 9 7 Reaping and transport Tomatoes 1 12 7 Destroying 0 0 5 Weeding 1 12 11 Cultivation 0 15 6 Supplying 0 13 4 Previous Expenditure 21 18 0 Total Expenditure 28 1 10			EXPENDITURE. 1933 Reaping peas 0 7 8 Reaping potatoes 0 2 2 Cassava nursery 0 2 6 Weeding 1 9 1 Green Dressing crop 1 7 5 Forking 0 13 8 Lining 0 1 6 Banking 1 3 4 Previous Expenditure 5 7 4 Total Expenditure 18 19 5		
REVENUE. 1933 Canes 16 11 0 Previous Revenue 11 10 2 Total 28 1 2 Deficit 1933 — Total Deficit — Profit 1933 9 18 3 Total Profit 5 15 6			REVENUE. 1933 Tomatoes 14 14 7 Previous Revenue 7 15 10 Total 22 10 5 Deficit 1933 — Total Deficit — Profit 1933 8 10 9 Total Profit —			REVENUE. 1933 Yams 1 17 0 Cassava 1 4 0 Peas 0 6 3 Eddoes 0 10 6 Potatoes 0 13 7 Previous Revenue 4 11 4 Total Revenue 10 16 7 Deficit 1933 0 16 0 Total Deficit 3 11 6 Profit 1933 — Total Profit —		

Preparation for canes 1931 Provisions, Vegetables and Cotton .. 1931
 Plant canes 1932 Preparation for canes .. 1932
 First Ratoons 1933 Preparation for canes .. 1933
 Reaped as plant canes March-April 1933.
 Yield B. 4596 13.05 tons = 26.1 per acre
 " S. Seedling 8.05 " = 26.8 " 19 Cassava reaped Dec. 1932 & Jan. 1933
 " P.O.J. 2878 6.35 " = 37.4 " 20 Pigeon Peas destroyed June 1933.
 " B.H. 10.12* 0.15 " = 4.8 " 21 Eddoes reaped Dec. 1932 & Jan. 1933.
 * Planted late and overshadowed by other canes.
 Trash ranged. Banks split and manured with
 sulphate of ammonia. 260 lb. per acre.

MODEL ALLOTMENT. TABLE A.

PLOT 23.			PLOT 24.			PLOT 25.			PLOTS 26 & 27.		
Vegetables ..	1931	Vegetables ..	1931	Stock ..	1931	Stock ..	1931	Stock ..	1931	Stock ..	1931
Sweet Potatoes ..	1932	Sweet Potatoes ..	1932	Corn and Potatoes ..	1932	Corn and Potatoes ..	1932	Corn and Potatoes ..	1932	Corn and Potatoes ..	1932
Tomatoes and then Yams	1933	Eddoes ..	1933	Eddoes ..	1933	Eddoes ..	1933	Eddoes ..	1933	Eddoes ..	1933
The following varieties were planted on 8.6.33. Seal Top			The following varieties were planted on 18.7.33. Tannia			The following varieties were planted on 18.7.33. Tannia			The following varieties were planted in October: Bert		
Lisbon, Light Red and Crop.			Roziza, Tannia Priete, Tannia			Roziza, Tannia Priete, Tannia			V. 52 and Brooks Seedling.		
Before planting the tomatoes			the plot was fertilized with Tannia			the plot was fertilized with Tannia					
rotted seum cake and a small			dressing of complete artificial			dressing of complete artificial					
fertilizer.											
EXPENDITURE.			EXPENDITURE.			EXPENDITURE.			EXPENDITURE.		
1933	£	s. d.	1933	£	s. d.	1933	£	s. d.	1933	£	s. d.
Tomato Crop ..	2	18 10	Reaping potatoes	0	0 8	Reaping Potatoes	0	3 5	Reaping Potatoes	0	7 0
Yam Crop ..	2	0 2	Eddoe crop*	1	2 2	Cassava Crop*	0	18 9	Preparing for re-planting Pots.*	1	3 5
	4	19 0		1	2 10		0	4 0		1	10 5
			*Weeding	0	6 1	*Weeding	0	4 0	*Weeding	0	8 0
			Forking	0	5 2	Forking	0	4 3	Forking	0	8 6
			Banking	0	4 8	Banking	0	4 8	Banking	0	6 0
			Planting	0	0 8	Planting	0	2 7	Manuring	0	6 0
			Trenching	0	5 7	Insect O.	0	2 9	Trenching	0	0 5
				1	2 2	Trenching	0	0 3	Lining	0	0 6
						Lining	0	0 3		1	3 5
Previous Expenditure	2	10 5	Previous Expenditure	2	10 5	Previous Expenditure	2	5 3	Previous Expenditure	4	10 7
Total	7	9 5	Total	3	13 3	Total	3	7 5	Total	6	1 0
REVENUE.			REVENUE.			REVENUE.			REVENUE.		
1933	£	s. d.	1933	£	s. d.	1933	£	s. d.	1933	£	s. d.
Potatoes ..	0	13 7	Potatoes ..	0	13 8	Potatoes ..	0	13 3	Potatoes ..	0	3 6 7
Tomatoes ..	3	15 0									
Previous Revenue	4	8 7	Previous Revenue	3	17 0	Previous Revenue	0	12 3	Previous Revenue	1	4 5
Total	8	5 7	Total	4	10 8	Total	2	5 6	Total	4	11 0
Deficit 1933	0	10 5	Deficit 1933	0	9 2	Deficit 1933	0	11 1	Deficit 1933	0	10 0
Total Deficit	0	10 5	Total Deficit	0	9 2	Total Deficit	0	11 1	Total Deficit	0	10 0
Profit 1933	0	16 2	Profit 1933	0	17 5	Profit 1933	0	11 1	Profit 1933	0	16 2
Total Profit	0	16 2	Total Profit	0	17 5	Total Profit	0	11 1	Total Profit	0	16 2

MODEL ALLOTMENT.

TABLE A.

PLOTS 28—30.

FRUIT.

It was found necessary during 1933 to remove the wind breaks of Elephant and Guatemala grass as the roots were injuring the fruit trees which have made much better growth since.

EXPENDITURE.

1933				£	s.	d.
Weeding	..	..	..	0	13	5
Forking	..	..	..	0	4	4
Mulching	..	..	..	0	5	3
Planting Pears	..	..	..	0	2	0
Watering	..	..	..	1	3	4
Manuring	..	..	..	0	4	2
Removal of grass wind breaks	..	..	..	1	9	1
				4	1	7
Previous Expenditure	..	..	..	7	10	7
Total	..	..	..	11	12	2

REVENUE.

1933				£	s.	d.
Previous Revenue	..	..	..	—		
Total	..	..	..	—		
Deficit 1933	..	..	..	4	1	7
Total Deficit	..	..	..	11	12	0
Profit 1933	..	..	..	—		
Total Profit	..	..	..	—		

MODEL ALLOTMENT

TABLE B.

TABLE OF CROP EXPENDITURE AND REVENUE.

VEGETABLES.					PIGEON PEAS.			
PLOTS 3, 4 & 5.					PLOT 6.			
Crop.	Expenditure.	Revenue.	Profit.	Loss.	Expenditure.	Revenue.	Loss.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
Tomatoes ..	7 3 8	12 8 0	5 4 4	..	1 12 4	0 11 4	1 1 0	
Beet ..	0 7 5	0 14 1	0 6 8	..	..	..	..	
Carrots ..	0 16 5	1 19 10	1 3 5	..	..	..	..	
Onions ..	0 18 1	0 8 0	..	0 10 1	..	..	..	
Okras ..	0 6 7	0 6 2	..	0 0 5	..	..	..	
Cabbage ..	0 6 7	..	..	0 6 7	..	..	..	
Egg Plants ..	0 6 7	0 4 5	..	0 2 2	..	..	..	
Beans ..	4 8 8	0 2 5	..	4 6 3	..	..	..	
Turnips ..	0 10 8	1 2 0	0 11 4	..	..	..	..	

PLANT CANES AND CATCH CROPS.				TOMATO CATCH CROP.			
PLOTS 7—12.				PLOTS 13—17.			
Crop.	Expenditure.	Revenue.	Profit.	Expenditure on Tomatoes.	Revenue.	Profit.	
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	
B. E. Peas ..	..	1 7 2	..	4 14 10	14 4 7	9 19 9	
Beans ..	..	1 14 10	..	..	..	..	
Tomatoes ..	..	8 8 2	..	..	..	..	
Canes ..	..	16 11 0	..	..	..	..	
	15 13 5	28 1 2	12 7 9	..	..	..	

Crop.	Plot.	Expenditure.	Revenue.	Profit.	Loss.
		£ s. d.	£ s. d.	£ s. d.	£ s. d.
YAMS ..	18	1 19 10	1 17 0	..	0 2 10
CASSAVA ..	19	0 17 11	1 7 11	0 10 0	..
PIGEON PEAS ..	20	2 5 1	1 1 7	..	1 3 6
EDDOES ..	21	0 18 6	2 1 4	1 2 10	..
SWEET POTATOES ..	22—24	2 2 7	5 14 4	3 11 9	..
" "	25—27	6 16 3*	4 19 10	..	1 16 5

* Formerly stock plot hence high cost of cultivation.

SUGAR CANE EXPERIMENTS.

Varietal Experiments.—The varietal experiments planted during the season 1931—32 were reaped as plant canes during the season under review. As originally planned the lay out at each station consisted of four randomised blocks for each of three different reaping periods, early crop, middle crop and late crop. This scheme was later modified to allow of only two reaping periods, early crop and late crop, and at Fitches Creek, while the same five varieties were included for both periods of reaping, the sixth variety was changed, B.H.10/11 being included in the early reaping experiment and G.119 in the late reaping experiment.

At Sandersons the very wet weather at the end of 1931 so retarded cultivation that the lay out planned became impracticable and instead of individual 1/25 acre plots, the individual plots in the blocks consisted of single rows of 55 stools each. The results from this experiment are not recorded in this report as the growth of certain varieties notably P.O.J.2878 was so vigorous as to suppress any variety which happened to be growing in the adjoining rows.

The results at the other three stations are given in the following tables.

Variety Trial.	Millars.	Plant Canes.
Soil Type. Calcareous	Rainfall Nov. 1931-Feb. 1933. Feb.-April 1933.	66.59 ins. 3.87 „

Field cultivated with ox-plough. Cross holed and trenched at right angles to banks. Planted with drill at 5' x 3½'.

Variety.	Date of Planting.	First Reaping 7-11/2/33 Four Replicates.			Second Reaping 19-24/4/33. Eight Replicates.		
		Cane tons per acre.	Sucrose in juice lb. per gall.	Sucrose tons per acre.	Cane tons per acre.	Sucrose in juice lb. per gall.	Sucrose tons per acre.
P. O. J. 2878	4&5/11/31	57.8	1.656	6.4	52.5		
B. 417	Supplied	46.2	1.571	4.95	38.9	Analyses not	
B. 11569	17/12/31	44.5	1.695	5.13	36.5	available.	
B. H. 10.12	12/2/32	40.7	2.179	5.95	36.2		
S. C. 12.4	18/3/32	39.2	1.791	4.77	36.4		
B. 4507*		29.6	1.518	3.06	24.6		

For both periods of reaping the results show a general significance by the Z test. For the first reaping differences in tonnage of cane greater than 6.4 tons per acre and for the second reaping differences greater than 4.3 tons are significant. The sucrose figures at all three stations are based in each case on single analyses and are not significant.

The low yield of B.4507* may in part be due to the difficulty of establishing this variety. S.C.12.4 also gave trouble in obtaining a good stand.

* Planting material from second ratoons.

Variety Trial		Fitches Creek.	Plant Canes.
Soil Type	Calcareous heavy	Rainfall. Dec. 1931-Feb. 1933.	64.90 ins.
		March-April 1933	4.03 „

Field gyrotilled and trenched parallel to banks. Planted flat at 5' x 2½'.

Variety.	Date of Planting.	First Reaping 21-28/2/33 Six Replicates.			Second Reaping 26-28/4/33 Six Replicates.		
		Cane tons per acre.	Sucrose in juice lb. per gal.	Sucrose tons per acre.	Cane tons per acre.	Sucrose in juice lb. per gall.	Sucrose tons per acre.
B. 11569	26-28/11/31	39.1	1.927	5.10	37.0	1.989	5.0
P. O. J. 2878	Supplied	37.6	2.018	5.11	43.5	2.236	6.58
B. H. 10. 12	11/1/32	35.6	2.088	5.02			
B. 4507	19/4/32	34.7	1.960	4.58	34.6	2.062	4.82
G. 140		34.2	1.895	4.38	29.2	1.789	3.52
P. O. J. 213		32.4	1.781	3.92	36.1	1.937	4.74
G. 119					33.6	2.010	4.60

For both periods of reaping the results show a general significance by the Z test. For the first reaping differences in tonnage of cane greater than 3.75 tons per acre and for the second reaping differences greater than 4.9 tons per acre are significant.

Variety Experiment.	Jolly Hill,	Plant Canes.
Soil Type. Alluvial	Jan. 1932-Feb. 1933	56.64
	Rainfall March-April 1933	2.34

Field cultivated with ox-plough and trenched at right angles to banks. Planted flat at 5' x 4'. Supplied with drill.

Variety.	Date of Planting.	First Reaping 27/3/33 Four Replicates.			Second Reaping 1-4/5/33 Eight Replicates.		
		Cane tons per acre.	Sucrose in juice lb. per gall.	Sucrose tons per acre.	Cane tons per acre.	Sucrose in juice lb. per gall.	Sucrose tons per acre.
P. O. J. 2878	22-24/12/31	28.4	2.007	3.86	23.6	1.966	3.1
B. 726	... Supplied	26.7	2.262	4.07	23.7	2.430	3.8
B. 891	... 11/2/32	22.7	2.254	3.45	21.5	2.314	3.3
B. 381	... 1/4/32	22.0	2.059	3.06	20.3	2.192	3.0
B.H. 10.12	.. 27/5/32	21.9	2.348	3.45	20.1	2.384	3.2
B. 374	...	20.9	2.096	2.96	19.1	2.077	2.7

The results for the second reaping show a general significance by the Z test and for this reaping differences in tonnage of cane greater than 2.25 tons per acre are significant.

P.O.J. 2878 has given good results at all stations, while Bl.726 has done well at Jolly Hill, the only station at which it was grown. Of the new varieties these two are easily the most promising.

The Guadeloupe seedling G.119 made good growth at Fitches Creek but the yield suffered from the large proportion of rotten canes found at harvest.

G.140 made rapid growth at first but yielded a fair proportion of rotten canes and was unable to resist the dry conditions between the first and second reaping periods.

Of the older varieties B.11569 has done well at the stations where it was cultivated.

Manurial Experiments.—The manurial experiment with the variety B.H.10/12 planted at Duers in January, 1931, and reaped as plant canes during 1932 was reaped as first ratoons on 7—13 June, 1933. This experiment was originally devised to investigate the effect of heavy applications of phosphate and potash in the presence of both high and low nitrogen, but in the case of the ratoon crop, (the results of which are here recorded), all plots received equal applications of nitrogen (2 cwt. per acre) so that the experiment became confined to an investigation of the residual effects of phosphate and potash, there being no significant increase due to nitrogen when reaped as plant canes in 1933.

The results obtained are given in the following tables:—

TABLE A. YIELD DATA AND TREATMENTS.

Treatment as Plant Canes.	Block A.	Block B.	Block C.	Block D.
	Qrs. per plot.	Qrs. per plot.	Qrs. per plot.	Qrs. per plot.
1 N ₁	58	37	37	22
2 N ₃	50	34	53	28
3 N ₁ K ₁	49	35	31	34
4 N ₁ K ₃	45	45	30	45
5 N ₃ K ₁	48	37	54	36
6 N ₃ K ₃	46	47	52	35
7 N ₁ P ₁	50	39	41	40
8 N ₁ P ₃	45	54	45	39
9 N ₃ P ₁	46	38	43	36
10 N ₃ P ₃	34	42	60	47
11 N ₁ K ₁ P ₁	40	61	59	50
12 N ₃ K ₁ P ₁	51	56	47	41
13 N ₁ K ₃ P ₁	50	40	61	48
14 N ₃ K ₃ P ₁	55	45	60	41
15 N ₁ K ₁ P ₃	60	42	51	37
16 N ₃ K ₁ P ₃	39	66	45	40
17 N ₁ K ₃ P ₃	46	53	45	37
18 N ₃ K ₃ P ₃	51	48	54	43

TABLE A—continued.

	Nitrogen only	P ₀	P ₁	P ₃	K ₀	K ₁	K ₃	N. K. & P.
Mean yield in tons per acre.	14.9	15.5	17.8	17.6	15.9	17.3	17.6	18.3

N_1 = 40 lb. Nitrogen per acre as Sulphate of Ammonia.
 N_3 = 120 lb. Nitrogen per acre as Sulphate of Ammonia.
 K_1 = 180 lb. Potash per acre as Sulphate of Potash.
 K_3 = 540 lb. Potash per acre as Sulphate of Potash.
 P_1 = 214 lb. Soluble Phosphoric anhydride per acre as Superphosphate.
 P_3 = 642 lb. Soluble Phosphoric anhydride per acre as Superphosphate.
 All plots as ratoons received. 2 cwt. Sulphate of Ammonia per acre.

TABLE B. ANALYSIS OF YIELD DATE.
ANALYSIS OF VARIANCE.

Due to	Sum of Squares.	Degrees of Freedom.	Variance.	$\frac{1}{2} \log e$ (Variance)
Blocks ..	1031	3	344	
Phosphate :.	569	2	284	2.822
Potash ..	268	2	134	2.450
Interactions (P x K) ..	197	4	49	
Error ..	3449	60	57	2,020
Total ..	5514	71		

The Value of Z for Superphosphate is .802 and for Potash .430. From Fisher's table Z for $N_1=2$ and $N_2=60$ is .5738 for probability .05 so that the value of Superphosphate shows a general significance and the standard error of the difference of means, viz. 1.67 tons per acre may be used as a test.

There is a significant increase for Superphosphate but no significant difference between P_1 and P_3 . This confirms the results obtained as plant canes.

For the two crops the total mean yields of the Superphosphate plots have been:

P ₀	49.9	tons	per	acre.
P ₁	57.3	"	"	"
P ₃	57.6	"	"	"

Cultural Experiment.—This experiment on which a preliminary note,* on relative germination figures, has already appeared in the 1932 report was conducted at Greencastle Experiment Station with the variety B.H.10/12 and was designed to compare the relative merits of flat and vertical planting (45°) and of spacing at 4½' x 4' and 4½' x 2'.

The lay out consisted of six randomised blocks the size of the individual plots being 1/24 acre. The whole area was manured with Sulphate of Ammonia in August, 1932, at the rate of 300 lb. per acre. The rainfall during the growing period, viz December, 1931, to February 1933, amounted to 81.92 ins.

The experiment was reaped in February, 1933. The mean yields were as follows:—

Flat	planting	spaced	4½' x 2'	..	43.1	tons	per	acre	(Mean of 6 plots)
"	"	"	4½' x 4'	..	40.5	"	"	"	"
Vertical	"	"	4½' x 2'	..	42.4	"	"	"	"
"	"	"	4½' x 4'	..	39.4	"	"	"	"
Mean of all	"flat"	plots	(12)	..	41.8	"	"	"	
"	"	"	"vertical" plots (12)	..	40.9	"	"	"	
"	"	"	Close spaced plots (12 plots)	..	42.73	"	"	"	
Mean of all	wide	spaced	plots (12 plots)	..	39.95	"	"	"	

Close spacing appears to have resulted in increased yields but an analysis of the results shows that the increase is not significant.

*Under wet conditions, % germination	72	flat	55	vertical
" " " " " "	43	"	17	"
" dry " " " "	45	"	91	"

COTTON SEED SELECTION.

Fifty pounds of pedigree seed was imported from Montserrat and a seed plot established on Thibous Estate. At the end of December the field looked well and promised to yield a fair quantity of seed for planting in 1934.

Only a small quantity of seed was obtained from the 1932 seed plot: this was planted all in one locality for further seed propagation purposes.

The bulk of the 1933-34 crop was sown with seed from fields rogued by the Department during the 1932-33 crop season. Ginning of this seed and the subsequent hand selection and storage were under the direct supervision of the cotton inspector. The improvement in purity of the island cotton crop resulting from this method of seed selection in 1930-31 and 1931-32 has been maintained during the season under review.

WORK IN CONNECTION WITH INSECT AND FUNGUS PESTS.

Moth Borer (*Diatraea saccharalis*). Mr. H. E. Box has continued his investigation of the ecology and control of this insect which has long been the most important pest of sugar cane in Antigua. The Tachinid fly (*Lixophaga diatraeae*) whose establishment in the island was recorded in the last report has been bred on the large scale and distributed in most cane growing districts.

Cotton Caterpillar (*Alabama argillacea*) did little damage during the season under review.

Pink Boll Worm (*Platyedra gossypiella*) was plentiful during the early months of 1933 and did considerable damage to the 1932-33 crop. By the end of 1933 it was abundant on the earlier planted fields of the 1933-34 crop.

AGRICULTURAL EXPORTS.

The following table shows the chief agricultural products exported during the years 1931, 1932 and 1933.*

Article.	1931.		1932.		1933.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
		£		£		£
Sugar ..	3,704 tons.	35,876	18,448 tons.	175,992	22,373 tons.	194,703
(crystals)						
Molasses ..	30,000 gals.	488	728,701 gals.	11,755	820,232 gals.	1,709
(V. Pan)						
Molasses ..	3,758 gals.	227	29,000 gals.	1,027		
(Muscovado)						
Cotton (Lint) ..	131,700 lb.	6,585	22,500 lb.	936	8,406 lb.	420
Cotton (Seed)	60 tons.	360	..	..	..	..
Lime Juice ..	..	..	1,280 gals.	75	9,189 gals.	557
(raw)						
Green Limes ..	51 brls.	47	173 brls.	144	85 brls.	22
Lime Oil ..	432 lb.	438	112 gals.	3,808	80 gals.	874
Tamarinds ..	397 brls.	348	520 brls.	450	495 brls.	427
Tomatoes ..	365 crates	130	815 crates	196	13 crates	3
Hides and Skins ..	..	116	..	61	..	85
Coconuts ..	..	..	..	..	33,400	135
Onions ..	..	..	1,805 crates	574	26 crates	8
Horses ..	..	..	17	74	4	40
Cattle ..	1	25	17	40	..	..
Asses ..	5	3	64	95	1	3
Sheep ..	29	11	74	21	3	15
Mules ..	12	96	20	304	7	40

* Figures supplied by Treasury.

PROGRESS IN THE CHIEF INDUSTRIES.

Sugar.—The rainfall during 1932 was ample and a record crop was reaped in 1933. The total production of grey crystals amounted to 23,875 tons of which 22,373 tons valued at £194,703 was exported.

Climatic conditions during 1933 were not quite so favourable as in 1932 and there was a considerable reduction in the area of plant cane for the 1934 crop partly owing to the difficulty of cultivating heavy soils during the wet months at the end of 1932. The prospects for the 1934 crop were, however, reasonably good at the end of 1933 the estimate being in the region of 20,000 tons.

An important step taken during the year was the formation of a Sugar Cane Investigation Committee for the furtherance of field experiments and the general application of scientific agriculture to the sugar industry. Arrangements have been made to secure the part time services of Mr. P. E. Turner, M.Sc., F.I.C., of the Imperial College of Tropical Agriculture in an advisory capacity. Mr. Turner paid his first visit to Antigua in November and advised as to the preliminary series of cultural experiments.

During 1933 Professor Hardy and Messrs. J. A. McDonald and G. Rodriguez of the Imperial College of Tropical Agriculture published an important paper on the Sugar Cane Soils of Antigua

This affords a useful basis for soil classification and has already proved of considerable value in connection with the field experiments referred to above.

A questionnaire was sent out by the agricultural department during 1933 with a view to obtaining definite information as to the acreages under different varieties, the yields per acre of these varieties, the manurial treatment of fields, the effect of time of planting on yield, etc., etc. Unfortunately, it was impossible to obtain information from a large number of estates though many groups were able to supply information in detail. The following summary of certain of the information received may be of interest:—

PLANT CANES FOR 1934. ACREAGE UNDER DIFFERENT VARIETIES.

Variety	B. H. 10/12	B. 4507	B. 11569	P. O. J. 2878	B 4596	S. C. 12/4	B 6308	Mixed	Total
Acreage	606	422	228	151	40	14	13	153	1627
% of Reported Area.	37.2	26.0	14.0	9.3	2.5	0.8	0.8	9.4	

1933 CROP AVERAGE YIELDS OF VARIOUS VARIETIES.

Variety Plant Canes			First Ratoons			Second Ratoons		
Variety	Acres	Average Tonnage per acre	Variety	Acres	Average Tonnage per acre.	Variety	Acres	Average Tonnage per acre
P.O.J. 2878	73.75	35.36	P.O.J. 2878	41.50	27.5	B. 4596	74.0	14.9
B. B. 4507	718.25	31.83	B. 417	31.75	21.7	B. 4507	315.0	14.81
B. H. 10/12	664.50	28.84	B. 4507	453.25	20.4	S.C. 12/4	39.5	14.52
B. 11569	254.00	28.20	B. 6308	110.25	20.01	B. 11569	54.5	14.21
B. 417	23.00	27.61	B. 4596	103.00	19.1	B. 3922	25.0	14.20
B. 4596	97.00	26.96	B. 11569	261.25	18.58	B.H. 10/12	426.0	13.87
B. 3922	30.25	26.62	S. C. 12/4	70.5	18.44	B. 417	21.0	12.76
B. 6308	88.25	24.33	B. H. 10/12	404.5	17.40	B. 6308	55.0	12.65
S. C. 12/4	71.50	21.42						
P.O.J. 234	16.25	18.40						
Total Reported	2036.75	29.51		1476	19.35		1010	14.2

1933 CROP. EFFECT OF TIME OF PLANTING ON YIELD.

Time of Planting	B. H. 10/12		B. 4507		B. 11569		P. O. J. 2878	
	Acres	Average Tons	Acres	Average Tons	Acres	Average Tons	Acres	Average Tons
Before Nov. 1	15.25	27.1	85	34.04	1	25	..	...
Nov 1—Dec. 31	354.5	31.13	579	31.9	23	34.8	18	51.2
Jan 1.—Mar 31	239.75	25.3	101	26.6	129	28.6	32	37.6
Apr. 1 onwards	60.75	25.35	1	16.0	131	26.1	17.5	21.7

While the above returns are by no means complete, in the case of the three most widely planted varieties, viz., B. 4507, B. H. 10/12, and B. 11569 the figures shown are obtained as averages of fairly extensive acreages and are probably fairly representative of the island as a whole.

Cotton.—The 1933 crop was reaped from approximately 200 acres. Heavy rains, severe attacks of the cotton caterpillar and the presence of pink boll worm affected the yield. The total production amounted to 26 bales, (7,800 lb.) clean lint and 2 bales (600 lb) stain which was all exported during 1933.

During the year 10 bales of the 1933 crop and 92 bales from stock in hand were sold at 11d., 11½d. and 1/- per lb. for clean lint and at 4½g—6½g per lb. for stains.

The acreage planted for the 1933—34 crop was between 60 and 70 acres, so that only a small crop can be expected in 1934. At the end of 1933, however, the prospects were that the yield per acre would be good.

LAND SETTLEMENT.

Greencastle.—At the end of December ninety-six lots had been taken up and with the exception of one shop site and one pasture plot were under cultivation.

During the year one allottee was evicted and notices were served on two others to take effect at the conclusion of the 1934 crop. Allottees have been given every chance to make good and eviction notices served only when it became quite evident that the persons concerned would never become satisfactory holders. There are still a small number of poor allotments and it will probably be necessary to evict the holders during 1934.

On the whole the majority of the plots have been maintained in a reasonably good condition and about twenty-five per cent. of the allottees are really good.

As was noted in the 1932 report, failure to pay attention to adequate drainage, failure to keep the growing crops free from weeds and a tendency to delay cultivation for cane until the planting season are the chief faults.

With respect to late cultivation a notice was sent to each allottee in August stating the cane area which he should cultivate for the 1935 crop, with instructions that in each case at least half of this area should be ready for planting by December. While generally admitting the benefits of early cultivation and planting, a number of allottees have disregarded these directions on the grounds that they cannot afford to decrease the value of their crop by cutting up standing canes.

The allottees supplied 1,426 tons, 9 cwt. of canes to Bendals factory for the 1933 crop. This was purchased at twelve shillings per ton amounting in all to £855.17.3. After deduction of weighing charges and sums due to the Government as loans or instalments of the purchase price of lots, the balance (£596.18.6) was paid to the allottees through the agricultural department.

Early in January a further payment of one shilling and eleven pence half-penny per ton was paid by Bendals Factory as a bonus on the 1933 crop making the gross value £995.10.8.

The 1934 crop will be reaped from 146 acres and is estimated at 1,800—1,900 tons.

Free cane plants were supplied to new allottees and in addition allottees generally were supplied free of charge with limited numbers of cuttings of promising new varieties from the nurseries at the Experiment Station.

During the period under review £14.8.6 was spent on care of roads and drainage.

Sulphate of Ammonia was provided for the manuring of ratoon crops, the value of the fertilizer supplied being regarded as a loan to be repaid on reaping the 1934 crop.

Matthews. At the end of 1933, ninety-four plots at Matthews had been allotted and were mostly under cultivation. As a rule the allotments on this estate are easier drained and kept clean than those on the heavy flat lands at Green-castle and consequently appear to be better cared, but during the year there were three evictions for failure to cultivate.

The 1933 crop amounted to 498 tons 2 cwt., of which 493 tons 11 cwt. were sold to the Antigua Sugar Factory at fourteen shillings per ton amounting to £346. 17. 9, and the remainder to Bendals at a total price of £1. 9. 1. After deducting the cost of weighing, packing and land purchase instalments the sum of £259. 15. 0. was paid to the allottees.

The 1934 crop will be reaped from 105 acres and is estimated at 939 tons.

During the year under review free cane plants were supplied to new allottees at a cost of £9.16s. 0d., and £6. 9s. 0d. was spent on roads and drains. Over seven acres were cultivated with the gyrotiller the loans made to cover cost of cultivation being secured by the 1935 crop.

Jonas's. Jonas's estate was purchased during 1933 for land settlement purposes and at the end of the year was being surveyed prior to allotment.

Land Settlement General. During 1933, twenty-five Grape Fruit, fifty-eight Oranges and four Tangerines were distributed free of cost to peasants on the old land settlements in the Wallings and Sawcolts districts.

ANTIGUA COTTON GROWERS' ASSOCIATION.

During the period under review there was no change in the personnel of the Association.

Peasants' cotton was again purchased at the Antigua Cotton Factory, 13,274 lb. clean lint and 818 lb. stained lint being purchased at 1½d. and ½d. per lb. respectively.

The Honourable R. S. D. Goodwin represented the Association at the West Indian Cotton Conference which was held in Trinidad early in November.

OFFICIAL VISITS.

Visits were paid to the Experiment Station by the following:—His Excellency the Governor Lieut. Col. Sir Reginald St. Johnston, K.C.M.G., Mr. G. A. Jones, Dip. Agric., Commissioner of Agriculture, Dr. McIntosh of the Central Cane Breeding Station, Barbados, Mr. P. E. Turner, M.Sc., F.I.C., of the Imperial College of Tropical Agriculture and Mr. A. K. Briant, Assistant to the Commissioner of Agriculture.

CORRESPONDENCE.

During the year under review 207 Minute Papers were dealt with, 406 letters were received and 696 letters were despatched.

AGRICULTURAL EDUCATION.

Monthly lectures to teachers of Primary Schools were given by the Agricultural Superintendent during the months of January to May.

The course of weekly lectures on agriculture for overseers started in September, 1933, was continued by the Agricultural Superintendent until he went on leave in May and after his departure was carried on during the months of June—August by the help of the Honourable A. E. Collens, F.I.C., F.C.S., Government Chemist. It is proposed to start these lectures again in 1934.

SUMMARY OF LEGISLATION AFFECTING ANIMALS, PLANTS, CROPS ETC.

The summary published in the report for the period April to December, 1931, remains unaltered save for the following amendments.

ANIMALS.

S.R. & O. No. 20 of 1933 made under Sec. 18 of the Diseases of Animals Ordinance No. 16 of 1913 prohibits the landing of animals from Trinidad unless accompanied by a satisfactory veterinary certificate.

COTTON.

The Cotton Seed Control Ordinance No. 10 of 1932 prohibits the planting of any cotton seed other than that inspected and approved by the Agricultural Officer.

The Cotton Export Levy Ordinance No. 9 of 1933 provides for a levy on all cotton exported from the Presidency, the funds thus obtained being used for the purpose of furthering the interests of the cotton industry.

S.R. & O. No. 22 of 1933 made under Sec. 3 of the Cotton Export Levy Ordinance No. 9 of 1933 fixes the levy at the rate of $\frac{1}{2}$ d. per lb.

PLANTS.

S.R. & O. No. 3 of 1933, made under Sec. 5 of the Plants Protection Ordinance No. 16 of 1933 modifies the schedules in the 1931 proclamation so as to permit the importation of fruit from the United States of America when accompanied by a Certificate of Origin and prohibits the importation of bananas and parts of banana plants from Barbados.

**RETURN OF RAINFALL ON THE FOLLOWING PLACES IN ANTIGUA FROM
1ST. JANUARY TO 31ST. DECEMBER 1933.**

Name.	No.	January.	February.	March	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Wallings Dam ...	1	4.23	2.84	1.79	3.41	4.12	4.53	4.56	2.11	11.34	3.69	7.93	1.74	55.29
„ Hill ...	2	4.16	2.80	1.70	3.31	3.98	4.43	4.37	2.13	11.21	3.62	7.98	1.73	54.42
Body Ponds ...	3	2.63	1.43	1.24	3.47	5.04	4.03	7.73	2.56	11.12	3.53	6.43	2.92	52.13
New Division ...	4	2.56	1.18	1.01	2.14	5.91	3.65	6.41	3.74	12.59	1.48	7.22	3.77	51.69
Bendals Factory ...	5	2.13	1.06	1.16	2.80	6.20	2.30	7.14	2.78	11.66	3.14	7.87	3.24	51.48
Sandersons ...	6	2.34	1.30	1.12	2.79	6.49	2.50	7.10	1.97	8.59	5.08	8.04	2.17	49.79
Blakes ...	7	2.65	1.30	0.74	3.19	7.44	1.29	7.50	1.79	9.81	4.68	5.72	3.35	49.46
Antigua Sugar Factory ...	8	2.51	1.01	1.63	3.74	7.53	3.28	6.27	1.65	7.96	2.05	7.72	4.01	49.39
Belvidere ...	9	2.08	1.20	0.77	2.11	6.12	2.74	6.51	2.91	11.23	3.38	7.01	3.00	49.12
Vernons ...	10	3.03	0.56	1.49	3.53	6.16	1.86	9.07	0.97	7.81	3.82	8.51	1.89	48.73
Morris Looby ...	11	2.25	0.90	0.58	2.98	7.92	2.47	6.50	2.62	7.50	1.67	7.50	5.07	47.96
Pattersons ...	12	2.38	1.44	1.19	2.04	3.65	2.88	7.23	1.93	10.06	3.62	6.65	3.38	46.45
Bennett Bryson's Office ...	13	1.80	0.70	1.73	2.56	5.77	2.05	5.89	2.83	10.14	3.18	5.59	3.60	45.84
Orange Valley ...	14	2.83	1.24	0.56	0.02	4.74	3.77	4.58	0.90	10.08	4.08	7.12	4.70	44.62
Yeptons ...	15	1.08	0.56	2.06	2.07	5.40	2.29	6.23	3.36	10.32	1.60	6.31	3.14	44.42
Botanic Station ...	16	1.69	0.90	1.53	2.90	5.79	2.76	5.47	2.86	9.13	1.68	5.31	4.28	44.30
Lyons ...	17	2.04	1.05	0.90	3.45	3.61	3.27	7.17	1.98	9.05	3.55	5.44	2.70	44.21
Betty's Hope ...	18	2.05	1.04	0.88	3.41	5.04	2.01	6.31	1.57	8.67	3.62	7.21	2.25	44.06
Yorks ...	19	1.66	1.15	2.67	1.67	4.64	1.78	5.13	2.10	10.92	2.10	6.75	3.32	43.89
Burkes ...	20	2.80	0.91	0.63	2.59	5.88	1.31	4.94	3.43	8.52	3.19	5.97	3.38	43.55
Creekside ...	21	3.90	0.70	0.75	3.50	3.35	5.48	7.11	1.86	7.71	1.80	5.06	2.23	43.48
Five Islands ...	22	1.43	0.94	1.42	2.35	4.56	2.41	6.13	2.50	10.42	1.61	6.66	2.89	43.32
Belmont ...	23	2.90	0.53	1.67	2.72	5.11	3.73	5.52	2.38	8.52	2.16	5.76	2.29	43.29
Carlisle ...	24	1.60	1.00	2.20	1.20	4.40	3.60	4.11	1.00	6.70	5.60	6.70	5.11	43.22
Willis Freemans ...	25	2.40	0.93	0.62	2.22	6.28	1.28	4.97	2.31	8.47	4.97	5.08	2.20	41.76
Cochranes and Thomases ...	26	2.05	0.98	0.64	2.56	4.87	2.71	4.45	2.43	7.51	4.34	5.29	2.80	40.63
Donovans ...	27	2.06	0.72	1.03	3.03	5.70	2.66	5.67	1.29	6.38	2.40	6.95	2.17	40.36
Fitches Creek ...	28	1.40	0.90	1.26	2.67	6.55	2.04	5.25	1.50	7.12	2.02	5.89	3.71	40.31
Collins ...	29	1.86	1.03	0.69	3.12	3.83	3.49	5.23	1.83	9.15	2.88	5.05	2.12	40.28

**RETURN OF RAINFALL ON THE FOLLOWING PLACES IN ANTIGUA FROM
1ST. JANUARY TO 31ST. DECEMBER 1933.**

Name.	No.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
The Diamond ..	30	1.79	0.83	0.81	2.56	4.88	1.46	5.72	1.42	7.27	3.94	7.15	2.40	40.23
Judges ...	31	1.52	0.56	1.92	2.96	4.80	1.60	4.70	2.37	8.51	2.11	4.91	3.92	39.88
Millars ...	32	1.60	0.25	1.30	1.20	4.11	3.00	4.40	0.92	6.12	5.10	6.50	5.10	39.60
Weatherills ...	33	0.86	0.46	0.84	2.90	3.59	4.08	5.55	2.12	8.78	2.06	5.55	9	39.38
Duers ...	34	1.91	1.18	0.87	2.61	4.85	1.24	5.19	1.43	6.75	4.75	6.45	2.11	39.34
Point Wharf ...	35	1.77	0.69	1.59	1.30	4.84	2.12	4.51	3.46	10.22	1.50	4.30	3.10	39.20
Crosbies ...	36	0.30	0.11	0.30	3.10	3.82	3.95	4.21	1.69	8.72	2.60	6.75	3.10	38.65
Comfort Hall ..	37	1.61	0.71	0.84	2.87	2.95	3.47	4.41	1.60	8.72	4.66	5.65	1.15	38.64
Cassada Gardens ...	38	1.28	0.55	1.20	2.41	5.44	1.79	4.55	2.27	8.25	2.07	5.38	3.26	38.45
Delaps ...	39	2.09	1.82	0.69	1.73	5.90	1.65	4.74	2.26	7.97	3.05	4.08	2.83	38.31
Gilberts ...	40	1.79	0.79	0.90	3.25	4.26	1.90	4.61	1.22	7.34	3.36	6.73	2.09	38.24
Cooks ...	41	2.10	0.70	1.17	2.10	3.50	1.97	6.30	1.72	8.60	1.50	6.50	2.66	38.22
Thibou Jarvis ..	42	1.95	0.48	0.84	3.01	2.95	2.72	4.78	2.06	8.30	1.99	6.37	2.72	38.17
Blackmans ...	43	1.83	0.71	1.02	2.16	5.49	1.98	4.53	1.37	6.14	2.81	6.78	3.20	38.02
Parham Lodge ...	44	2.35	0.68	0.90	2.81	4.78	2.27	4.42	1.07	5.92	3.38	6.95	2.15	37.68
Cedar Valley ...	45	0.91	0.42	0.63	2.12	5.72	1.97	4.40	2.26	8.38	2.37	5.49	2.98	37.65
Parham New Work	46	1.77	0.65	0.93	2.40	4.90	2.20	4.65	1.04	6.82	3.55	6.15	2.20	37.26
Langfords ...	47	0.60	0.51	0.62	2.20	3.37	4.43	4.96	1.47	8.75	1.88	5.62	2.49	36.90
Pares & Cochranes	48	2.23	0.92	0.72	3.01	4.60	1.98	3.97	0.92	6.85	3.44	6.67	1.52	36.83
The Garden ..	49	1.97	0.75	0.64	2.93	5.61	1.13	4.88	1.65	6.98	3.11	5.73	1.36	36.74
Marble Hill ...	50	0.50	0.15	0.40	2.39	3.98	3.60	5.22	2.15	8.37	2.10	4.89	2.58	36.33
North Sound ..	51	1.85	0.63	1.32	2.65	4.68	1.50	5.01	1.19	6.34	2.71	6.36	2.09	36.33
Gaynors ...	52	1.35	1.05	0.55	2.96	1.80	2.66	4.46	1.30	8.18	3.69	5.74	2.31	36.05
High Point ..	53	1.08	0.35	0.64	3.34	4.47	2.37	3.62	1.49	7.32	1.49	6.24	3.15	35.56
Long Lane ..	54	0.99	0.70	1.30	3.14	3.26	2.96	4.28	1.20	8.71	2.72	4.76	1.24	35.26
Cedar Hill ..	55	2.21	0.73	0.96	3.13	2.90	4.58	5.04	1.11	5.27	1.44	6.69	0.80	31.86
Mercers Creek ...	56	1.69	0.53	0.73	2.72	2.53	2.68	3.64	1.31	7.21	2.58	6.15	1.76	33.53
Montpelier ...	57	1.97	0.53	0.54	2.42	2.99	0.77	3.73	1.52	7.28	5.27	3.81	1.93	32.76
The Cotton ...	58	2.30	0.69	0.77	2.87	3.11	1.65	4.10	0.97	6.23	2.48	5.56	1.86	32.59
Weirs ...	59	2.50	3.50	1.75	1.40	1.00	1.46	2.22	0.65	6.17	4.72	3.35	2.67	31.39
Codrington Village Barbuda		2.99	0.75	1.02	1.95	4.32	2.44	3.95	3.81	11.94	2.65	7.79	6.77	56.38

AVERAGE RAINFALL 1874—1933.

AVERAGE MONTHLY RAINFALL, 1933.

In	1874	the	average	rainfall	on	41	stations	was	ins.		inches.
	1875	"	"	"	"	40	"	"	28.78		
	1876	"	"	"	"	36	"	"	41.98	January	.. 1.98
	1877	"	"	"	"	38	"	"	49.05		
	1878	"	"	"	"	53	"	"	47.11	February	.. 0.92
	1879	"	"	"	"	52	"	"	61.54		
	1880	"	"	"	"	46	"	"	49.68	March	.. 1.07
	1881	"	"	"	"	44	"	"	53.75		
	1882	"	"	"	"	45	"	"	33.04	April	.. 2.62
	1883	"	"	"	"	56	"	"	55.51		
	1884	"	"	"	"	56	"	"	43.98	May ..	.. 4.69
	1885	"	"	"	"	53	"	"	43.39		
	1886	"	"	"	"	55	"	"	47.78	June ..	.. 2.60
	1887	"	"	"	"	50	"	"	43.68		
	1888	"	"	"	"	47	"	"	44.23	July ..	.. 5.28
	1889	"	"	"	"	50	"	"	73.59		
	1890	"	"	"	"	45	"	"	33.00	August	.. 1.87
	1891	"	"	"	"	45	"	"	50.01		
	1892	"	"	"	"	53	"	"	38.43	September	.. 8.40
	1893	"	"	"	"	54	"	"	38.69		
	1894	"	"	"	"	68	"	"	38.85	October	.. 3.04
	1895	"	"	"	"	69	"	"	52.91		
	1896	"	"	"	"	56	"	"	59.85	November	.. 6.18
	1897	"	"	"	"	54	"	"	39.67		
	1898	"	"	"	"	66	"	"	48.85	December	.. 2.85
	1899	"	"	"	"	63	"	"	47.50		41.50
	1900	"	"	"	"	64	"	"	36.95		
	1901	"	"	"	"	65	"	"	57.61		
	1902	"	"	"	"	71	"	"	58.80		
	1903	"	"	"	"	68	"	"	43.68		
	1904	"	"	"	"	70	"	"	37.01		
	1905	"	"	"	"	68	"	"	31.40		
	1906	"	"	"	"	66	"	"	53.93		
	1907	"	"	"	"	70	"	"	43.45		
	1908	"	"	"	"	72	"	"	43.79		
	1909	"	"	"	"	70	"	"	45.15		
	1910	"	"	"	"	70	"	"	34.77		
	1911	"	"	"	"	72	"	"	36.47		
	1912	"	"	"	"	72	"	"	32.20		
	1913	"	"	"	"	73	"	"	42.76		
	1914	"	"	"	"	72	"	"	36.86		
	1915	"	"	"	"	75	"	"	56.14		
	1916	"	"	"	"	74	"	"	58.23		
	1917	"	"	"	"	70	"	"	36.62		
	1918	"	"	"	"	70	"	"	37.87		
	1919	"	"	"	"	70	"	"	49.56		
	1920	"	"	"	"	70	"	"	30.09		
	1921	"	"	"	"	74	"	"	30.32		
	1922	"	"	"	"	70	"	"	35.14		
	1923	"	"	"	"	68	"	"	32.41		
	1924	"	"	"	"	67	"	"	41.57		
	1925	"	"	"	"	68	"	"	30.75		
	1926	"	"	"	"	70	"	"	50.20		
	1927	"	"	"	"	67	"	"	45.84		
	1928	"	"	"	"	63	"	"	33.24		
	1929	"	"	"	"	66	"	"	40.78		
	1930	"	"	"	"	59	"	"	25.51		
	1931	"	"	"	"	63	"	"	48.62		
	1932	"	"	"	"	63	"	"	58.47		
	1933	"	"	"	"	59	"	"	41.50		

The average rainfall for 60 years is 43.47 inches, so that the rainfall for the year 1933 is 1.97 inches below the average.

METEOROLOGICAL SUMMARY, 1933.

KEPT AT THE BOTANIC STATION, ANTIGUA.

MONTH	THERMOMETER								BAROMETER READING		RAINFALL BOTANIC STATION	BAROMETER CORRECTED		THERMOMETER	
	DRY		WET		RELATIVE HUMI- DITY %		MAXIMUM	MINIMUM							
	9 A M	3 P M	9 A M	3 P M	9 A M	3 P M	MAXIMUM	MINIMUM	9 A M	3 P M	HIGHEST	LOWEST	HIGHEST MAX.	LOWEST MIN.	
January	78.9	79.0	73.5	73.8	76.7	77.3	82.0	71.0	30.055	29.985	1.69	30.133	29.889	87	68
February	78.5	79.0	71.0	71.0	68.1	66.2	82.0	69.0	30.100	30.043	0.90	30.179	29.910	88	66
March	80.1	80.9	73.3	73.3	71.1	68.5	84.6	72.0	30.073	30.044	1.53	30.156	29.904	89	67
April	81.9	81.3	74.3	74.7	68.8	73.3	86.5	72.0	30.024	29.968	2.90	30.104	29.923	90	69
May	83.4	84.4	76.3	76.4	70.8	68.8	87.8	73.9	30.034	29.982	5.79	30.094	29.920	92	71
June	83.4	83.8	77.6	77.5	76.8	74.5	86.9	74.5	30.018	29.968	2.76	30.075	29.923	89	72
July	83.4	84.5	78.0	78.4	77.8	75.7	87.0	75.8	30.027	29.994	5.47	30.099	29.903	89	72
August	84.5	85.6	78.0	78.4	74.4	71.7	89.3	75.0	30.004	29.953	2.86	30.097	29.872	92	72
September	82.0	83.0	77.8	78.0	81.9	79.5	86.4	74.7	29.974	29.921	9.13	30.051	29.864	91	70
October	83.7	83.6	78.1	78.0	77.2	77.4	87.1	74.3	29.940	29.872	1.68	30.012	29.789	91	72
November	80.8	81.1	76.6	76.7	82.2	81.5	84.4	73.6	29.961	29.882	5.31	30.063	29.546	88	71
December	78.8	80.0	74.1	74.4	79.5	75.8	82.6	71.2	30.046	29.986	4.28	30.142	29.884	84	69
Means for the Year ...	81.6	82.2	75.7	75.9	75.4	74.2	85.6	72.9	30.021	29.965	44.30				

Highest Maximum Temperature = 92° on 25th May and on 20th, 21st, and 22nd August.
 Lowest Minimum Temperature = 66° on 22nd February.
 Highest Barometer (corr.) = 30.179 on 14th February.
 Lowest Barometer (corr.) = 29.638 on July 25th.
 Greatest Rainfall in 24 hours = 3.16 ins on 11th September.

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